

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of separating a liquid from buoyant components presented in a mixture ~~thereof~~ of a liquid, buoyant components and entrapped gas bubbles, the method comprising ~~the steps of:~~

providing a separator chamber and a member dividing the separator chamber into a first part and a second part and defining a communication passage for liquid flow from the first part into the second part;

introducing the mixture into the first part of the separator chamber by causing the flow of the mixture to be propelled through a lift conduit to the first part of the separator chamber using the force provided by the entrapped gas bubbles to lift the buoyant components; and

flowing the liquid from the first part through the communication passage into the second part of the separator chamber while substantially accumulating the buoyant components in the first part.

2. (Original)..The method of claim 1, wherein the communication passage includes at least one tube.

3. (Original) The method of claim 1, wherein the communication passage defines at least one opening adjacent the bottom of the chamber.

4. (Original) The method of claim 1, wherein the communication passage defines at least one gap adjacent the bottom of the first part of the chamber.

5. (Original) The method of claim 1, wherein the communication passage includes a porous support.

6. (Original) The method of claim 1, wherein the communication passage includes a filter medium.

7. (Currently Amended) The method of claim 1, further comprising ~~the step of:~~

providing a receiving chamber fluidly coupled with the separator chamber, wherein the receiving chamber receives the mixture; and

transporting at least a portion of the liquid and buoyant components of the mixture into the first part of the separator chamber from the receiving chamber via the lift tube, at least partially propelled by the gas bubbles.

8. (Currently Amended) The method of claim 7, further comprising ~~the step of~~:

directing liquid substantially free of buoyant components to a discharge conduit in the receiving chamber.

9. (Cancelled)

10. (Currently Amended) The method of claim 7, further comprising ~~the step of~~:

imparting a circular motion to the mixture as it enters the receiving chamber.

11. (Currently Amended) The method of claim 7, further comprising ~~the step of~~:

reducing velocity of the mixture as it enters the receiving chamber.

12. (Currently Amended) The method of claim 11, further comprising ~~the step of~~:

providing a perforated layer in the receiving chamber.

13. (Currently Amended) The method of claim 1, further comprising ~~the step of~~:

releasing the buoyant components from a drain outlet in the first part of the separator chamber.

14. (Currently Amended) The method of claim 1, further comprising ~~the step of~~:

scooping the separated buoyant components from the first part of the separator chamber.

15. (Currently Amended) The method of claim 1, further comprising ~~the step of~~:

removing the separated buoyant components from the liquid with a filtration medium.

16. (Currently Amended) The method of claim 1, further comprising ~~the step of~~:

providing an internal combustion engine and exhaust system in combination with the separator chamber, the mixture flowing from the exhaust system into the separator chamber.

17. (Original) The method of claim 1, wherein the buoyant components include non-fluid components.

18. (Original) The method of claim 17, wherein the non-fluid components include soot.

19. (Original) The method of claim 1, wherein the buoyant components include fluid components.

20. (Original) The method of claim 19, wherein the fluid components include fuel.

21. (Currently Amended) The method of claim 1, further comprising ~~the step of~~:

providing the first part and second part of the chamber side-by-side.

22. (Currently Amended) The method of claim 1, further comprising ~~the step of~~:

providing the first part of the chamber at least partially above the second part of the chamber.

23. (Currently Amended) A component separator for separating a liquid from buoyant components and entrapped gas bubbles presented in a mixture thereof, comprising:

a first separation chamber constructed and arranged to receive in a first part thereof, via a lift conduit, said [[a]] mixture, propelled at least in part by force imparted by the entrapped gas bubbles including a liquid and buoyant components;

a second part of the separation chamber, fluidly coupled to the first part of the separation chamber; and

a communication passage constructed and arranged to provide the fluid communication between the first and second parts of the separation chambers, wherein the liquid flows through the communication passage from the first part of the separation chamber into the second part of the separation chamber while the buoyant components substantially accumulate in the first part of the separation chamber.

24. (Original) The apparatus of claim 23, wherein the communication passage includes at least one tube.

25. (Original) The apparatus of claim 23, wherein the communication passage defines at least one opening.

26. (Currently Amended) The apparatus of claim 23, wherein the communication passage defines at least one gap adjacent the bottom of the ~~first~~ separation chamber.

27. (Original) The apparatus of claim 23, wherein the communication passage includes a porous support.

28. (Original) The apparatus of claim 23, wherein the communication passage includes a filter medium.

29. (Currently Amended) The apparatus of claim 23, further comprising ~~a separator chamber constructed and arranged to form the first and second chambers, and~~ a wall constructed and arranged to divide the separation chamber into the first and second ~~chambers~~ parts.

30. (Currently Amended) The apparatus of claim 29, wherein the wall defines the communication passage adapted to provide fluid communication between the first and second ~~chambers~~ parts.

31. (Currently Amended) The apparatus of claim 29, further comprising:

a receiving chamber fluidly coupled to the separator chamber via a lift conduit, the receiving chamber adapted to receive the mixture including the liquid and buoyant components, wherein at least a portion of the buoyant components and liquid rise to the separator chamber.

32. (Currently Amended) The apparatus of claim 31, further comprising:

[[a]]the lift conduit provided in a top plate of the receiving chamber, the lift conduit constructed and arranged to provide fluid communication between the receiving chamber and the separator chamber.

33. (Original) The apparatus of claim 32, wherein the top plate is funnel shaped.

34. (Original) The apparatus of claim 31, further comprising:

a discharge conduit provided in the receiving chamber, the discharge conduit adapted to discharge the liquid remaining in the receiving chamber, the liquid being substantially free of buoyant components.

35. (Original) The apparatus of claim 31, wherein buoyant effect of entrapped gas in the mixture causes at least some liquid and buoyant components to rise to the separator chamber.

36. (Original) The apparatus of claim 31, further comprising:

an inlet adapted to introduce mixture including the liquid and buoyant components into the receiving chamber, the inlet constructed and arranged to impart circular motion to the mixture in the chamber.

37. (Original) The apparatus of claim 31, further comprising:

an inlet adapted to introduce liquid including buoyant components into the receiving chamber, the inlet constructed and arranged to reduce velocity of the incoming mixture.

38. (Original) The apparatus of claim 29, further comprising:

a drain outlet provided in the first chamber of the separator chamber adapted to release buoyant components from the separator chamber.

39. (Currently Amended) The apparatus of claim 29, further comprising:

a filtration medium constructed and arranged to trap at least a portion of the buoyant components in the first ~~chamber~~ part of the separator chamber.

40. (Original) The apparatus of claim 29, in combination with an internal combustion engine having fluid injected exhaust gas, and a separator adapted to separate the liquid mixture from the exhaust gas, the liquid mixture, including liquid and buoyant components, directed to the separator chamber.

41. (Original) The apparatus of claim 23, wherein the buoyant components include non-fluid components.

42. (Original) The apparatus of claim 41, wherein the non-fluid components include soot.

43. (Original) The apparatus of claim 23, wherein the buoyant components include fluid components.

44. (Original) The apparatus of claim 43, wherein the fluid components include fuel.

45. (Currently Amended) The apparatus of claim 23, wherein the first ~~chamber~~ part and second part of the separation chamber are provided side-by-side.

46. (Currently Amended) The apparatus of claim 23, wherein the first part of the separation chamber is provided at least partially above the second part of the separation chamber.

47. (Currently Amended) A component separator, comprising:

a separator chamber constructed and arranged to receive a mixture including a liquid, entrapped gas bubbles and buoyant components, via a lift chamber through which the mixture is propelled using force provided by the entrapped gas bubbles to lift the buoyant components;

a wall constructed and arranged to separate the separator chamber into a first part adapted to receive the mixture and a second part; and

a communication passage adjacent a bottom surface of the first part of the separator chamber adapted to provide fluid communication between the first part and second part of the separator chamber,

wherein the liquid in the first part flows through the communication passage from the first part into the second part of the separator chamber while the buoyant components substantially accumulate in the first part.

48. (Original) The apparatus of claim 47, wherein the communication passage includes at least one tube.

49. (Original) The apparatus of claim 47, wherein the communication passage defines at least one opening in the wall adjacent the bottom surface of the first part of the separator chamber.

50. (Original) The apparatus of claim 47, wherein the communication passage defines at least one gap adjacent the bottom surface of the first part of the separator chamber.

51. (Original) The apparatus of claim 47, wherein the wall includes a porous support.

52. (Original) The apparatus of claim 47, wherein the wall includes a filter medium.

53. (Original) The apparatus of claim 47, further comprising:

a receiving chamber fluidly coupled to the separator chamber, the receiving chamber adapted to receive the mixture including the liquid and buoyant components, wherein at least a

portion of the buoyant components and liquid rise to the separator chamber.

54. (Original) The apparatus of claim 53, further comprising:

a lift conduit provided in a top plate of the receiving chamber, the lift conduit constructed and arranged to provide fluid communication between the receiving chamber and the separator chamber.

55. (Original) The apparatus of claim 53, further comprising:

a discharge conduit provided in the receiving chamber, the discharge conduit adapted to discharge the liquid remaining in the receiving chamber, the liquid being substantially free of buoyant components.

56. (Original) The apparatus of claim 53, wherein buoyant effects of entrapped gas in the liquid cause at least some liquid and buoyant components to rise to the separator chamber.

57. (Original) The apparatus of claim 53, further comprising:

an inlet adapted to introduce the mixture including liquid and buoyant components into the receiving chamber, the inlet constructed and arranged to impart circular motion to the mixture in the chamber.

58. (Original) The apparatus of claim 53, further comprising:

an inlet adapted to introduce the mixture including liquid and buoyant components into the receiving chamber, the inlet constructed and arranged to reduce velocity of the incoming mixture.

59. (Original) The apparatus of claim 47, further comprising:

a filtration medium constructed and arranged to accumulate at least a portion of the buoyant components in the first part of the separator chamber.

60. (Original) The apparatus of claim 47, in combination with an internal combustion engine having fluid injected exhaust gas, and a separator adapted to separate the liquid mixture from the exhaust gas, the liquid mixture, including liquid and buoyant components, directed to the separator chamber.

61. (Original) The apparatus of claim 47, wherein the first part of the chamber and the second part of the chamber are provided side-by-side.

62. (Original) The apparatus of claim 47, wherein the first part of the chamber is provided at least partially above the second part of the chamber.

63. (New) The method of claim 1, further comprising exhausting at least some of the exhaust gas after it passes through the lift conduit.

64. (New) The method of claim 63, wherein the entrapped gas originates at least partly from an engine exhaust.

65. (New) The method of claim 63, wherein the entrapped gas is provided at least partly by a pumping mechanism.

66. (New) The apparatus of claim 23, further including a gas exhaust port through which entrapped gas reaching the first chamber may be exhausted.

67. (New) The apparatus of claim 66, wherein the entrapped gas originates at least partly from an engine exhaust.

68. (New) The apparatus of claim 66, wherein the entrapped gas is provided at least partly by a pumping mechanism.

69. (New) In combination,

an engine which produces an exhaust mixture of a flowing liquid, buoyant components and entrapped exhaust gas bubbles; and

a component separator for separating the liquid from the buoyant components and entrapped gas bubbles, the component separator comprising:

a first chamber constructed and arranged to receive via a lift conduit said mixture, propelled at least in part by force imparted by the entrapped gas bubbles,

a second chamber, fluidly coupled to the first chamber, and

a communication passage constructed and arranged to provide fluid communication between the first and second chambers,

wherein the liquid flows through the communication passage from the first chamber into the second chamber while the buoyant components substantially accumulate in the first chamber.